

SECTION III—REMARKS

This amendment is submitted in response to the Office Action mailed February 23, 2006. Claims 23 and 24 are amended and claims 14-25 remain pending in the application. Applicants respectfully request reconsideration of the application and allowance of all pending claims in view of the above amendments and the following remarks.

Claim Objections

The Examiner objected to claims 23 and 24 because of alleged informalities in these claims. Specifically, in claim 23 the examiner alleges that the limitation “the active surface” has insufficient antecedent basis and in claim 24 the examiner alleges that it is unclear whether the limitation “embedding the MEMS device in the conveyance” refers to the detached MEMS device or another MEMS structure.

Applicants have amended claim 23 so that it now recites “an active surface” instead of “the active surface.” Applicants also amended claim 24 so that it now recites “embedding the detached MEMS device in the conveyance.” Applicants respectfully submit that these amendments overcome the Examiner’s objections.

Rejections Under 35 U.S.C. § 103

The Examiner rejected all pending claims as obvious in view of, and therefore unpatentable over, different combinations of one or more of the following references: U.S. Patent No. 5,504,026 to Kung (“*Kung*”); U.S. Patent No. 6,430,109 to Khuri-Yakub *et al.* (“*Khuri*”); U.S. Patent No. 6,436,853 to Lin (“*Lin*”); and U.S. Patent No. 6,452,238 to Orcutt *et al.* (“*Orcutt*”). In particular, the Examiner rejected claims 14-15 and 19-20 as unpatentable over *Kung* in view of *Khuri* and rejected claims 23 and 25 as unpatentable over *Lin* and *Khuri* in view of *Orcutt*.

Applicants respectfully traverse the Examiner's rejections. To establish a *prima facie* case of obviousness, three criteria must be met: (1) the prior art references must teach or suggest all the claim limitations; (2) some suggestion or motivation to combine the references must be found in the prior art; and (3) there must be a reasonable expectation of success. MPEP § 2143. For at least the reasons explained below, Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness.

Claim 14 recites a process combination including providing a semiconductor device including an active surface; providing a conveyance with at least one embedded MEMS device disposed therein; and supporting the conveyance over the active surface "using a plurality of electrical contacts in a contact array, wherein the at least one embedded MEMS device communicates electrically to the semiconductor device via at least one of the contacts in the contact array." The Examiner concedes that *Kung* does not disclose a combination including a conveyance supported using a plurality of contacts in a contact array, wherein the at least one embedded MEMS device communicates electrically to the semiconductor device via at least one of the contacts in the contact array. Nonetheless, the Examiner alleges that *Khuri* makes up for this deficiency in *Kung*'s disclosure and concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine *Kung* with *Khuri* to arrive at the claimed invention.

Applicants respectfully disagree, because *Kung* teaches away from combination with *Lin*. *Kung* discloses methods for planarization and encapsulation of micromechanical devices. As shown in Fig. 7, a MEMS device 48 is first formed on substrate 10. After MEMS device 48 is complete, an epitaxial layer 54 is deposited on those areas of substrate 10 not occupied by MEMS device 48 (col. 5, lines 34-36). After epitaxial layer 54 is

complete, a semiconductor circuit 70 is built on upper surface 60 of epitaxial layer 54, and interconnection between semiconductor circuit 70 and MEMS device 48 is achieved by patterning and etching connections on the upper surface 60 of epitaxial layer 54 (col. 6, line 62 – col. 7, line 15).

Kung teaches away from combination with *Lin* because it teaches that MEMS device 48 must be formed before semiconductor circuit 70, and that semiconductor circuit 70 and all connections between it and other components must be built on top of epitaxial layer 54 to overcome problems associated with patterning and etching the semiconductor circuit 70 and its connections after raised features such as MEMS device 48 are formed on substrate 10 (col. 1, lines 52-62). *Kung* therefore teaches that there should be no connections between substrate 10 and epitaxial layer 54 or MEMS device 48, because these connections would have to be patterned and etched after MEMS device 48 was formed and would encounter the problems *Kung* was designed to solve. That being the case, *Kung* teaches one skilled in the art not to combine with *Lin* or any other reference that teaches a connection with the substrate. For at least these reasons, Applicants submit that claim 14 is allowable over the combination of *Kung* and *Lin*, and respectfully request withdrawal of the rejection and allowance of the claim.

Regarding claims 15-22, if an independent claim is non-obvious under 35 U.S.C. § 103, then any claim depending therefrom is also non-obvious. MPEP § 2143.03; In re Fine, 837 F.2d 1071 (Fed. Cir. 1988). As discussed above, claim 14 is in condition for allowance. Applicants submit that claims 15-22 are therefore allowable by virtue of their dependence on allowable independent claims, as well as by virtue of the features recited

therein. Applicants therefore respectfully request withdrawal of the rejections and allowance of these claims.

Claim 23 was rejected as unpatentable over *Lin* in view of *Khuri* and further in view of *Orcutt*. As amended, claim 23 recites a process combination including providing a semiconductor device; supporting a conveyance over an active surface “using a plurality of electrical contacts in a contact array, wherein the conveyance surrounds the detached MEMS device and the detached MEMS device communicates electrically to the semiconductor device via at least one of the contacts in the contact array”; and contacting encapsulation material with at least one of the semiconductor device, the detached MEMS device, and the conveyance to form an integrated MEMS package.

The Examiner concedes that *Lin* does not disclose a combination including a conveyance supported using a plurality of contacts in a contact array, wherein the at least one embedded MEMS device communicates electrically to the semiconductor device via at least one of the contacts in the contact array. The Examiner also concedes that *Lin* does not disclose a combination including contacting encapsulation material with at least one of the semiconductor device, the detached MEMS device, and the conveyance to form an integrated MEMS package. Nonetheless, the Examiner alleges that *Khuri* and *Orcutt* make up for these disclosure deficiencies and concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine *Lin* with *Khuri* and *Orcutt* to arrive at the claimed invention.

Applicants respectfully disagree. *Lin* discloses a method for making a microstructure assembly. In Figures 11a and 11b, *Lin* shows a MEMS device formed on a substrate. An isolation layer is formed on either side of the MEMS device, and a

micropackage substrate is positioned over the MEMS device and bonded to the isolation layer using a microheater and a bonding material. The Examiner characterizes the isolation layer as a conveyance. Accepting, purely for the sake of argument, the Examiner's characterization of the isolation layer as a conveyance, *Lin* teaches away from the combination attempted by the Examiner with *Lin* and *Orcutt*. Why? *Lin* teaches that the entire isolation layer, as its name implies, should be made of a material that is electrically isolating, so that current does not flow through the isolation layer from the microheater into the substrate (col. 7, lines 1-11). Since by definition the isolation layer conducts no electricity, one skilled in the art would not be motivated to support the isolation layer on a substrate "using a plurality of electrical contacts in a contact array," because such electrical contacts would be useless when coupled to an isolation layer. *Lin* therefore teaches against the combination with *Lin* and *Orcutt* attempted by the Examiner. For at least these reasons, Applicants submit that claim 23 is allowable over the combination of *Lin*, *Khuri* and *Orcutt* and respectfully request withdrawal of the rejection and allowance of the claim.

Regarding claims 24-25 if an independent claim is non-obvious under 35 U.S.C. § 103, then any claim depending therefrom is also non-obvious. MPEP § 2143.03; In re Fine, 837 F.2d 1071 (Fed. Cir. 1988). As discussed above, claim 23 is in condition for allowance. Applicants submit that claims 24-25 are therefore allowable by virtue of their dependence on allowable independent claims, as well as by virtue of the features recited therein. Applicants therefore respectfully request withdrawal of the rejections and allowance of these claims.

Conclusion

Given the above amendments and accompanying remarks, all claims pending in the application are in condition for allowance. If the undersigned attorney has overlooked a teaching in any of the cited references that is relevant to allowance of the claims, the Examiner is requested to specifically point out where such teaching may be found. Further, if there are any informalities or questions that can be addressed via telephone, the Examiner is encouraged to contact the undersigned attorney at (206) 292-8600.


Charge Deposit Account

Please charge our Deposit Account No. 02-2666 for any additional fee(s) that may be due in this matter, and please credit the same deposit account for any overpayment.

Respectfully submitted,

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